



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,416	01/27/2004	Akihiro Matsui	1612.69212	4165
24978	7590	07/12/2005	EXAMINER	
GREER, BURNS & CRAIN 300 S WACKER DR 25TH FLOOR CHICAGO, IL 60606			NGO, HUYEN LE	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/766,416

**Applicant(s)**

AKIHIRO MATSUI

**Examiner**

Julie-Huyen L. Ngo

**Art Unit**

2871

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 and 13-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-12 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/27/2004</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Group II and Species 1 (Figs. 1-2, claims 10-12) in a response filed on June 18, 2005 is acknowledged.

Applicant's arguments regarding the restriction requirement have been considered; however, the traversal was on the grounds that there is no serious burden on the Examiner in examining all of claims 10-18 together. This is not found persuasive since Species 1 drawn to three-layered gate lines with rough surface is different from Species 2 drawn to four-layered gate lines with flat surface.

Therefore, the requirement is deemed proper and is considered to be final.

Accordingly, claims 1-9 and 13-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions and species, there being no allowable generic or linking claim. Therefore, ONLY claims 10-12 and 18 are pending in the elected Species.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dojo et al. (US6528357B2) in view Yamada (US6426733B1).

Dojo et al. teach (Figs. 1-4) forming a liquid crystal display comprising:

Claim 10:

- a liquid crystal display substrate 311;
- a main wiring layer 1110 made of Al or Al alloy (Al--Nd alloy film 1110) and formed on said substrate, wherein said main wiring layer forms gate wiring lines and storage capacitor wiring lines;
- a protective layer containing refractory metal (Mo film 1111) and formed on the main wiring layer,

Claim 11:

- a gate insulating film 115/117 covering said protective layer;
- a semiconductor layer 120 formed on said gate insulating film;
- an insulating layer (an interlayer dielectric film 127) covering a region above said semiconductor layer; and
- pixel electrodes 131 formed on said insulating layer.

Claim 12:

- an opposing substrate 201; and
- a liquid crystal layer 400 sandwiched between said liquid crystal display substrate and said opposing substrate.

wherein

Claim 18:

- said main layer is double layered film Al/Mo so that this main layer has suppressed hillocks or whiskers and grains inherently occur in any thin film.

This grains cause the rough surface of thin film, the degree of roughness depends on size of particles of Al or Mo that form the thin film.

However, Dojo et al. fail to disclose that an upper surface of said main wiring layer having an average roughness of 3 nm or larger.

Yamada teaches (Figs. 5A-B) forming an upper surface of said main wiring layer with paste or screen printing having an average roughness Ra of 3 nm or larger for suppressing discharge and short-circuiting (col. 3 lines 20-22).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display as Dojo et al. disclosed with an upper surface of said main wiring layer with paste or screen printing having an average roughness Ra of 3 nm or larger for suppressing discharge and short-circuiting thereby improving the manufacture yield, as taught by Yamada (col. 3, lines 20-22).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Jeong et al. (US6081308A) disclose a liquid crystal display having gate lines formed by double-layered film.

Ahn et al. (US6344377B2) disclose a liquid crystal display having gate lines formed by Mo/Al and AlTa/Al double layers for hillock-free Al gate metallization.

Art Unit: 2871

Seo et al. (US5825437 A) disclose a liquid crystal display having gate lines formed by Mo/Al and AlTa/Al double layers with first metal layer 2a, 2b, 2c formed on a substrate 1 and preferably composed of an aluminum alloy. In the Al alloy, an impurity is added to an aluminum site including a refractory metal having a first melting temperature. On each first metal layer 2a, 2b, 2c, a corresponding second metal layer 3a, 3b, 3c, respectively, is formed. Each second metal layer 3a, 3b, 3c is preferably composed of a pure aluminum, or an aluminum alloy preferably having a refractory metal with a second melting temperature lower than the first melting temperature.

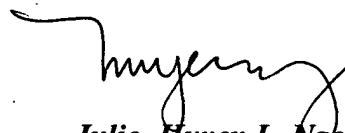
### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (571) 272-2295. The Examiner can normally be reached on T-Friday.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Robert H. Kim can be reached at (571) 272-2293.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.

July 10, 2005



**Julie-Huyen L. Ngo**  
Primary Examiner  
Art Unit 2871